Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1-105. (Canceled).

106. (Currently Amended) A light source unit that generates light with a single wavelength, said light source unit comprising:

a light generating portion which generates ~~light with~~ a single wavelength laser light having a wavelength of around 1.5μm;

a fiber group made up of a plurality of optical fibers arranged in parallel on an output side of said light generating portion; ~~and~~

a light amount control unit which controls light amount emitted from said ~~optical~~ fiber group by individually turning on/off light output from each optical fiber of said ~~optical~~ fiber group; and

a wavelength conversion portion which generates one of an eighth-harmonic wave and a tenth-harmonic wave of said single wavelength laser light having said wavelength of around 1.5μm from said fiber group.

107. (Previously Presented) The light source unit according to Claim 106, wherein at least an output end of each of said plurality of optical fibers making up said fiber group is bundled so as to structure a bundle-fiber.

108. (Previously Presented) The light source unit according to Claim 106, wherein

at least one stage of a fiber amplifier that can perform optical amplification is arranged on a part of each optical path, which is structured including said each optical fiber, and

said light amount control unit performs on/off operation of said light output from said each optical fiber by switching intensity of pumped light from a pumping light source of said fiber amplifier.

109. (Previously Presented) The light source unit according to Claim 108, wherein said light amount control unit performs said switching of pumped light intensity by selectively setting intensity of pumped light from said pumping light source to one of a predetermined level and a zero level.

110. (Previously Presented) The light source unit according to Claim 109, wherein said light amount control unit selectively sets said intensity of pumped light from said pumping light source to one of said predetermined level and said zero level by performing on/off operation on said pumping light source.

111. (Previously Presented) The light source unit according to Claim 108, wherein said light amount control unit performs said intensity switching of said pumped light by selectively setting said pumped light intensity from said pumping light source to one of a predetermined first level and a second level smaller than said first level.

112. (Previously Presented) The light source unit according to Claim 108, wherein

said each optical path has a plurality of said fiber amplifiers arranged, and

said light amount control unit performs on/off operation of said light output from said each optical fiber by switching intensity of pumped light from a pumping light source of a fiber amplifier arranged at a final stage.

113. (Previously Presented) The light source unit according to Claim 112, wherein a mode field diameter of said fiber amplifier arranged most downstream directly before said light output is large, when compared with other fiber amplifiers arranged before said fiber amplifier.

114. (Previously Presented) The light source unit according to Claim 106, said light source further comprising:

a memory unit which has an output intensity map corresponding to an on/off state of light output from said each optical fiber stored in advance, and

said light amount control unit individually turns on/off light output from said each optical fiber based on said output intensity map and a predetermined set light amount.

115. (Previously Presented) The light source unit according to Claim 114, wherein said output intensity map is made based on dispersion of light output from said each optical fiber measured in advance.

116. (Previously Presented) The light source unit according to Claim 114, said light source further comprising:

a wavelength conversion portion which converts a wavelength of said light output from said each optical fiber; and

said output intensity map is made with further consideration on light output dispersion due to dispersion in wavelength conversion efficiency, which corresponds to light output from said each optical fiber measured in advance.

117. (Previously Presented) The light source unit according to Claim 116, wherein

said light generating portion generates a single wavelength laser beam within the range of infrared to visible region, and

said wavelength conversion portion emits ultraviolet light which is a harmonic wave of said single wavelength laser beam.

118. (Previously Presented) The light source unit according to Claim 117, wherein

said light generating portion generates a single wavelength laser beam that has a wavelength of around 1.5μm, and

said wavelength conversion portion generates one of an eighth-harmonic wave and a tenth-harmonic wave of said single wavelength laser beam having said wavelength of around 1.5μm.

119-121. (Canceled).

122. (Previously Presented) The light source unit according to Claim 106, wherein

said light generating portion includes a light source which generates light having a single wavelength and an optical modulator which converts and emits said light from said light source into a pulse light having a predetermined frequency, and

said light amount control unit further controls at least one of a frequency and a peak power of said pulse light emitted from said optical modulator.

123. (Previously Presented) The light source unit according to Claim 106, said light source unit further comprising a delay portion, which individually delays light output from said plurality of optical fibers respectively so as to stagger said light output temporally.

124. (Previously Presented) The light source unit according to Claim 106, wherein

said light generating portion has a laser light source to oscillate a laser beam, and said light source unit further comprises:

a beam monitor mechanism which monitors the optical properties of said laser beam related to wavelength stabilizing to maintain a center wavelength of said laser beam to a predetermined set wavelength; and

a wavelength calibration control unit which performs wavelength calibration based on temperature dependence data of detection reference wavelength of said beam monitor mechanism.

125. (Previously Presented) The light source unit according to Claim 124, said light source further comprising:

a polarization adjustment unit which orderly arranges a polarized state of a plurality of light beams with the same wavelength having passed through said plurality of optical fibers; and

a polarized direction conversion unit which converts all light beams having passed through said plurality of optical fibers into a plurality of linearly polarized light beams that have the same polarized direction.

126. (Previously Presented) The light source unit according to Claim 125, wherein

at least a fiber amplifier that can perform optical amplification is arranged on a part of each optical path, which is structured including said each optical fiber, and

said fiber amplifier has an optical fiber, which main material is one of phosphate glass and bismuth oxide glass doped with a rare-earth element, serving as an optical waveguide member.

127. (Currently Amended) A light source unit that generates light with a single wavelength, said light source unit comprising:

a light generating portion that has a single wavelength laser light source ~~which generates said light with a single wavelength~~ and an optical modulator to generate a single wavelength pulse light having a wavelength of around 1.5μm ~~which converts light from said light source into a pulse light with a predetermined frequency and emits said pulse light~~;

a light amplifying portion which includes at least one fiber amplifier to amplify said pulse light generated by said light generating portion; ~~and~~

a light amount control unit which controls light amount emitted ~~output~~ from said light amplifying portion ~~fiber amplifier~~ by controlling a frequency of said pulse light; and ~~emitted from said optical modulator~~

a wavelength conversion portion which generates one of an eighth-harmonic wave and a tenth-harmonic wave of said pulse light having said wavelength of around 1.5μm.

128. (Previously Presented) The light source unit according to Claim 127, said light source unit further comprising:

a memory unit which has an output intensity map corresponding to a frequency of said pulse light entering said light amplifying portion stored, and

said light amount control unit controls said frequency of said pulse light emitted from said optical modulator based on said output intensity map and a predetermined set light amount.

129. (Previously Presented) The light source unit according to Claim 127, wherein said light amount control unit further controls a peak power of said pulse light emitted from said optical modulator.

130. (Previously Presented) The light source unit according to Claim 127, wherein

said optical modulator is an electrooptical modulator, and

said light amount control unit controls said frequency of said pulse light by controlling a frequency of voltage pulse impressed on said optical modulator.

131. (Previously Presented) The light source unit according to Claim 127, wherein

said light amplifying portion is arranged in plural and in parallel, and

an output end of each said light amplifying portion is each made up of an optical fiber.

132. (Previously Presented) The light source unit according to Claim 131, wherein a plurality of said optical fibers that respectively make up said light amplifying portion in plural are bundled so as to structure a bundle-fiber.

133-135. (Canceled).

136. (Previously Presented) The light source unit according to Claim 127, wherein

said light generating portion has a laser light source serving as said light source that oscillates a laser beam, and said light source unit further comprises:

a beam monitor mechanism which monitors the optical properties of said laser beam related to wavelength stabilizing to maintain a center wavelength of said laser beam to a predetermined set wavelength; and

a wavelength calibration control unit which performs wavelength calibration based on temperature dependence data of detection reference wavelength of said beam monitor mechanism.

137. (Previously Presented) The light source unit according to Claim 136, wherein

said light amplifying portion is arranged in plural and in parallel, and said light source unit further comprises:

a polarization adjustment unit which orderly arranges a polarized state of a plurality of light beams with the same wavelength having passed through said plurality of optical fibers that respectively structure said plurality of light amplifying portions; and

a polarized direction conversion unit which converts all light beams having passed through said plurality of optical fibers into a plurality of linearly polarized light beams that have the same polarized direction.

138. (Previously Presented) The light source unit according to Claim 137, wherein said fiber amplifier has an optical fiber, which main material is one of phosphate glass and bismuth oxide glass doped with a rare-earth element, serving as an optical waveguide member.

139. (Currently Amended) A light source unit that generates light with a single wavelength, said light source unit comprising:

a light generating portion that has a single wavelength laser light source ~~which generates light with a single wavelength~~ and an optical modulator to generate a single wavelength pulse light having a wavelength of around 1.5μm w~~hich converts light from said light source into a pulse light with a predetermined frequency and emits said pulse light~~;

a light amplifying portion which includes at least one fiber amplifier to amplify said pulse light generated by said light generating portion; ~~and~~

a light amount control unit which controls light amount emitted ~~output~~ from said light amplifying portion by controlling a peak power of said pulse light; and ~~emitted from said optical modulator~~

a wavelength conversion portion which generates one of an eighth-harmonic wave and a tenth-harmonic wave of said pulse light having said wavelength of around 1.5μm.

140. (Previously Presented) The light source unit according to Claim 139, said light source unit further comprising:

a memory unit which has an output intensity map corresponding to intensity of said pulse light entering said light amplifying portion stored, and

said light amount control unit controls said peak power of said pulse light emitted from said optical modulator based on said output intensity map and a predetermined set light amount.

141. (Previously Presented) The light source unit according to Claim 139, wherein

said optical modulator is an electrooptical modulator, and

said light amount control unit controls said peak power of said pulse light by controlling a peak level of voltage pulse impressed on said optical modulator.

142. (Previously Presented) The light source unit according to Claim 139, wherein

said light amplifying portion is arranged in plural and in parallel, and

an output end of each said light amplifying portion is each made up of an optical fiber.

143. (Previously Presented) The light source unit according to Claim 142, wherein a plurality of said optical fibers that respectively make up said light amplifying portion in plural are bundled so as to structure a bundle-fiber.

144. (Previously Presented) The light source unit according to Claim 142, said light source unit further comprising a delay portion, which individually delays light output from said plurality of light amplifying portions respectively so as to stagger said light output temporally.

145-147. (Canceled).

148. (Previously Presented) The light source unit according to Claim 139, wherein

said light generating portion has a laser light source serving as said light source that oscillates a laser beam, and said light source unit further comprises:

a beam monitor mechanism which monitors the optical properties of said laser beam related to wavelength stabilizing to maintain a center wavelength of said laser beam to a predetermined set wavelength; and

a wavelength calibration control unit which performs wavelength calibration based on temperature dependence data of detection reference wavelength of said beam monitor mechanism.

149. (Previously Presented) The light source unit according to Claim 148, wherein

said light amplifying portion is arranged in plural and in parallel, and said light source unit further comprises:

a polarization adjustment unit which orderly arranges a polarized state of a plurality of light beams with the same wavelength having passed through said plurality of optical fibers that respectively structure said plurality of light amplifying portions; and

a polarized direction conversion unit which converts all light beams having passed through said plurality of optical fibers into a plurality of linearly polarized light beams that have the same polarized direction.

150. (Previously Presented) The light source unit according to Claim 149, wherein said fiber amplifier has an optical fiber, which main material is one of phosphate glass and

bismuth oxide glass doped with a rare-earth element, serving as an optical waveguide member.

151. (Currently Amended) A light source unit, said unit comprising:

a laser light source which oscillates a laser beam;

a fiber amplifying portion which amplifies said laser beam from said laser light source;

a beam monitor mechanism which monitors an optical property ~~the optical properties~~ of said laser beam related to wavelength stabilizing to maintain a center wavelength of said laser beam to a predetermined set wavelength; and

a first control unit which performs wavelength calibration based on temperature dependence data of detection reference wavelength of said beam monitor mechanism.

152. (Previously Presented) The light source unit according to Claim 151, said light source unit further comprising:

an absolute wavelength provision source which provides an absolute wavelength close to said set wavelength, and

said first control unit performs an absolute wavelength calibration to make said detection reference wavelength of said beam monitor mechanism almost coincide with said absolute wavelength provided by said absolute wavelength provision source, and also a set wavelength calibration to make said detection reference wavelength coincide with said set wavelength based on said temperature dependence data.

153. (Previously Presented) The light source unit according to Claim 152, wherein

said beam monitor mechanism includes a Fabry-Perot etalon,

said temperature dependence data includes data based on measurement results on temperature dependence of a resonance wavelength of said Fabry-Perot etalon, and

said first control unit performs said absolute wavelength calibration and said set wavelength calibration on said detection reference wavelength by controlling a temperature of said Fabry-Perot etalon structuring said beam monitor unit.

154. (Previously Presented) The light source unit according to Claim 152, wherein

said temperature dependence data further includes data on temperature dependence of a center wavelength of said laser beam oscillated from said laser light source, and

said first control unit performs wavelength control of said laser light source together, when performing said absolute wavelength calibration.

155. (Previously Presented) The light source unit according to Claim 152, wherein

said absolute wavelength provision source is an absorption cell on which said laser beam is incident, and

said first control unit maximizes absorption of an absorption line closest to said set wavelength of said absorption cell, as well as maximize transmittance of said Fabry-Perot etalon, when performing said absolute wavelength calibration.

156. (Currently Amended) The light source unit according to Claim 151, further comprising:

a wavelength conversion portion which includes a nonlinear optical crystal to convert a wavelength of said laser beam from said fiber amplifying portion.

~~said light source unit further comprising a fiber amplifier, which amplifies said laser beam from said laser light source.~~

157. (Currently Amended) The light source unit according to Claim 156, wherein

said laser beam has a single wavelength of around 1.5μm, and said wavelength conversion portion generates one of an eighth-harmonic wave and a tenth-harmonic wave of said laser beam having said wavelength of around 1.5μm.

~~said light source unit further comprising a wavelength conversion unit, which includes a nonlinear optical crystal to convert a wavelength of said amplified laser beam.~~

158. (Previously Presented) The light source unit according to Claim 151, said light source unit further comprising a second control unit which feedback controls a wavelength of said laser beam from said laser light source after said set wavelength calibration is completed, based on monitoring results of said beam monitor mechanism which has completed said set wavelength calibration.

159. (Previously Presented) The light source unit according to Claim 151, said light source unit further comprising:

a plurality of light amplifying portions arranged in parallel that respectively include fiber amplifiers on the output side of said laser light source;

a polarization adjustment unit which orderly arranges a polarized state of a plurality of light beams with the same wavelength having passed through said plurality of optical fibers that respectively structure said plurality of light amplifying portions; and

a polarized direction conversion unit which converts all light beams having passed through said plurality of optical fibers into a plurality of linearly polarized light beams that have the same polarized direction.

160. (Previously Presented) The light source unit according to Claim 159, wherein said fiber amplifier has an optical fiber, which main material is one of phosphate glass and bismuth oxide glass doped with a rare-earth element, serving as an optical waveguide member.

161. (Previously Presented) A light source unit, said unit comprising:

a plurality of optical fibers;

a polarization adjustment unit which orderly arranges a polarized state of a plurality of light beams with the same wavelength having passed through said plurality of optical fibers; and

a polarized direction conversion unit which converts all light beams having passed through said plurality of optical fibers into a plurality of linearly polarized light beams that have the same polarized direction.

162. (Previously Presented) The light source unit according to Claim 161, wherein

said polarization adjustment unit polarizes respectively said plurality of light beams having passed through each of said optical fibers into a state nearly circular, and

said polarized direction conversion unit has a quarter-wave plate.

163. (Previously Presented) The light source unit according to Claim 162, wherein

said optical fibers have an almost cylindrical-symmetric structure; and

said polarization adjustment unit polarizes respectively said plurality of light beams incident on each of said optical fibers into a state nearly circular.

164. (Previously Presented) The light source unit according to Claim 161, wherein

said polarization adjustment unit polarizes respectively said plurality of light beams having passed through each of said optical fibers into an elliptic state almost identical, and

said polarized direction conversion unit has a half-wave plate that rotates a plane of polarization and a quarter-wave plate which is optically connected in series to said half-wave plate.

165. (Previously Presented) The light source unit according to Claim 161, wherein said plurality of optical fibers respectively are optical fibers making up an optical fiber amplifier, which amplifies a plurality of light beams subject to amplifying incident on said plurality of optical fibers, and waveguide said beams subject to amplifying.

166. (Previously Presented) The light source unit according to Claim 162, wherein said optical fiber is made mainly of one of phosphate glass and bismuth oxide glass doped with a rare-earth element.

167. (Previously Presented) The light source unit according to Claim 161, wherein said plurality of light beams incident on said plurality of optical fibers are respectively a pulse train.

168. (Previously Presented) The light source unit according to Claim 161, wherein said plurality of light beams incident on said plurality of optical fibers are respectively a light beam that has been amplified by at least one stage of an optical fiber amplifier before entering said plurality of optical fibers.

169. (Previously Presented) The light source unit according to Claim 161, wherein said polarization adjustment unit performs polarization adjustment by controlling optical properties of optical components arranged on the optical path further upstream of said plurality of optical fibers.

170. (Previously Presented) The light source unit according to Claim 161, wherein said plurality of optical fibers are bundled almost in parallel.

171. (Previously Presented) The light source unit according to Claim 161, said light source unit further comprising a wavelength conversion unit which performs wavelength conversion on light beams emitted from said polarized direction conversion unit by said light beams passing through at least one nonlinear optical crystal.

172. (Previously Presented) The light source unit according to Claim 171, wherein

light emitted from said plurality of optical fibers is light which wavelength is in one of an infrared and a visible region, and

light emitted from said wavelength conversion unit is light which wavelength is in an ultraviolet region.

173. (Previously Presented) The light source unit according to Claim 172, wherein

said light emitted from said plurality of optical fibers has a wavelength of around 1547nm, and

said light emitted from said wavelength conversion unit has a wavelength of around 193.4nm.

174. (Previously Presented) A light source unit, said unit comprising:

a light amplifying unit which includes an optical waveguiding member mainly made of any one of phosphate glass and bismuth oxide glass doped with a rare-earth element, and amplifies incident light; and

a wavelength conversion unit which converts a wavelength of light emitted from said light amplifying unit.

175. (Previously Presented) The light source unit according to Claim 174, wherein said optical waveguiding member is an optical fiber which has a core to waveguide light, and a cladding arranged in the periphery of said core.

176. (Previously Presented) The light source unit according to Claim 175, wherein said optical fiber is arranged linearly.

177. (Previously Presented) The light source unit according to Claim 175, wherein said light amplifying unit further includes at least a container to house said optical fiber.

178. (Previously Presented) The light source unit according to Claim 174, wherein said wavelength conversion unit includes at least one nonlinear optical crystal to perform wavelength conversion.

179. (Currently Amended) A wavelength stabilizing control method to maintain a center wavelength of a laser beam oscillated from a laser light source to a predetermined set wavelength, said wavelength stabilizing control method including:

a first step of measuring in advance temperature dependence of a detection reference wavelength of a wavelength detection unit used to detect a wavelength of said laser beam;

a second step of performing an absolute wavelength calibration to make said detection reference wavelength of said wavelength detection unit almost coincide with an absolute wavelength provided from an absolute wavelength provision source, said absolute wavelength close to said set wavelength; ~~and~~

a third step of setting said detection reference wavelength of said wavelength detection unit to said set wavelength, based on said temperature dependence obtained in said first step; and

a fourth step of controlling a wavelength of said laser beam from said laser light source, based on a detection result of said wavelength detection unit which said detection reference wavelength is set to said set wavelength in said third step.

180. (Previously Presented) The wavelength stabilizing control method according to Claim 179, wherein

said wavelength detection unit is a Fabry-Perot etalon, and

in said first step, temperature dependence of a resonance wavelength of said wavelength detection unit is measured;

in said second step, said resonance wavelength is made to almost coincide said absolute wavelength by controlling temperature of said wavelength detection unit; and

in said third step, said resonance wavelength is set as said set wavelength by controlling temperature of said wavelength detection unit.

181. (Previously Presented) The wavelength stabilizing control method according to Claim 180, wherein

said absolute wavelength provision source is an absorption cell on which said laser beam is incident, and

in said second step, absorption of an absorption line closest to said set wavelength of said absorption cell and transmittance of said wavelength detection unit are maximized.

182. (Previously Presented) The wavelength stabilizing control method according to Claim 179, wherein

in said first step, temperature dependence of said center wavelength of said laser beam is further measured in advance; and

in said second step, a wavelength control of said laser beam is performed together.

183. (Canceled).

184. (Previously Presented) The wavelength stabilizing control method according to Claim 182, wherein said wavelength control is performed, by controlling at least one of a temperature and a current supplied to said laser light source.

185. (Previously Presented) An exposure apparatus which transfers a pattern formed on a mask onto a substrate, said exposure apparatus comprising:

a light generating portion which generates a single wavelength laser beam within a range of infrared to visible region;

a fiber group made up of a plurality of optical fibers arranged in parallel on an output side of said light generating portion;

a light amount control unit which controls light amount emitted from said optical fiber group by individually turning on/off light output from each optical fiber of said optical fiber group;

a wavelength conversion portion which converts a wavelength of said laser beam emitted from said each optical fiber and emits ultraviolet light which is a harmonic wave of said laser beam; and

an illumination optical system which illuminates said ultraviolet light emitted from said wavelength conversion portion onto said mask as an illumination light for exposure.

186. (Previously Presented) The exposure apparatus according to Claim 185, said exposure apparatus further comprising:

a memory unit which has an output intensity map corresponding to an on/off state of light output from said each optical fiber stored in advance, and

said light amount control unit controls said light amount of said laser beam emitted from said optical fiber group by individually turning on/off light output from said each optical fiber based on said output intensity map and a predetermined set light amount.

187. (Previously Presented) The exposure apparatus according to Claim 185, wherein

said light generating portion has a light source which generates a laser beam with a single wavelength and an optical modulator which converts light from said light source into a pulse light with a predetermined frequency, and

said light amount control unit further controls light amount of said laser beam emitted from said optical fiber group by controlling a frequency of said pulse light emitted from said optical modulator.

188. (Previously Presented) The exposure apparatus according to Claim 187, wherein said light amount control unit further controls light amount of said laser beam emitted from said optical fiber group by controlling a peak power of said pulse light emitted from said optical modulator.

189. (Previously Presented) An exposure apparatus which transfers a pattern formed on a mask onto a substrate, said exposure apparatus comprising:

a light generating portion that has a light source which generates light with a single wavelength and an optical modulator which converts light from said light source into a pulse light with a predetermined frequency and emits said pulse light, and generates a laser beam having a single wavelength within a range of infrared to visible region;

a light amplifying portion which includes at least one fiber amplifier to amplify a pulse light generated in said light generating portion;

a light amount control unit which controls light amount output from said fiber amplifier by controlling a frequency of said pulse light emitted from said optical modulator;

a wavelength conversion portion which converts wavelength of said laser beam emitted from said light amplifying portion and emits ultraviolet light which is a harmonic wave of said laser beam; and

an illumination optical system which illuminates said ultraviolet light emitted from said wavelength conversion portion onto said mask as an illumination light for exposure.

190. (Previously Presented) The exposure apparatus according to Claim 189, wherein said light amount control unit further controls light amount of said laser beam emitted from said light amplifying portion by controlling a peak power of said pulse light emitted from said optical modulator.

191. (Previously Presented) An exposure apparatus which transfers a pattern formed on a mask onto a substrate, said exposure apparatus comprising:

a light generating portion that has a light source which generates light with a single wavelength and an optical modulator which converts light from said light source into a pulse light with a predetermined frequency and emits said pulse light, and generates a laser beam having a single wavelength within a range of infrared to visible region;

a light amplifying portion which includes at least one fiber amplifier to amplify a pulse light generated in said light generating portion;

a light amount control unit which controls light amount output from said light amplifying portion by controlling a peak power of said pulse light emitted from said optical modulator;

a wavelength conversion portion which converts a wavelength of said laser beam emitted from said light amplifying portion and emits ultraviolet light which is a harmonic wave of said laser beam; and

an illumination optical system which illuminates said ultraviolet light emitted from said wavelength conversion portion onto said mask as an illumination light for exposure.

192. (Previously Presented) An exposure apparatus which repeatedly transfers a pattern formed on a mask onto a substrate, said exposure apparatus comprising:

a light generating portion that has a light source which generates light with a single wavelength and an optical modulator which converts light from said light source into a pulse light;

a light amplifying portion which includes at least one fiber amplifier to amplify a pulse light generated in said light generating portion;

a control unit which controls at least one of a frequency and a peak power of said pulse light via said optical modulator in accordance with a position of an area subject to exposure on said substrate, when said substrate is exposed via said mask by irradiating said amplified pulse light on said mask.

193. (Previously Presented) The exposure apparatus according to Claim 192, wherein

said light source generates a laser beam in one of an infrared and a visible region, and said exposure apparatus further comprises:

a wavelength conversion portion which converts a wavelength of said pulse light amplified in said light amplifying portion into a wavelength of ultraviolet light.

194. (Previously Presented) An exposure apparatus which transfers a pattern formed on a mask onto a substrate, said exposure apparatus comprising:

a light generating portion that has a light source which generates light with a single wavelength and an optical modulator which converts light from said light source into a pulse light;

a light amplifying portion made up of a plurality of optical paths arranged in parallel on an output side of said light generating portion, said optical paths including at least one fiber amplifier to amplify said pulse light; and

a control unit which controls light amount of said pulse light emitted from said light amplifying portion by individually turning on/off light output from said plurality of optical paths respectively, when said substrate is exposed via said mask by irradiating said pulse light emitted from said light amplifying portion on said mask.

195. (Previously Presented) The exposure apparatus according to Claim 194, wherein

said light source generates a laser beam in one of an infrared and a visible region, and said exposure apparatus further comprises:

a wavelength conversion portion which converts a wavelength of said pulse light amplified in said light amplifying portion into a wavelength of ultraviolet light.

196. (Previously Presented) An exposure apparatus which illuminates a mask with a laser beam and transfers a pattern of said mask onto a substrate, said exposure apparatus comprising:

a light source unit that has a laser light source oscillating said laser beam, a beam monitor mechanism which monitors optical properties of said laser beam related to wavelength stabilizing in order to maintain said center wavelength of laser beam at a predetermined set wavelength, and an absolute wavelength provision source which provides an absolute wavelength close to said set wavelength;

a memory unit where a temperature dependence map is stored, said temperature dependence map made up of measurement data on both a center wavelength of said laser beam oscillated from said laser light source and a temperature dependence of a detection reference wavelength of said beam monitor mechanism;

a first control unit which performs an absolute wavelength calibration to make a detection reference wavelength of said beam monitor mechanism almost coincide with an absolute wavelength provided from said absolute wavelength provision source, and also performs a set wavelength calibration to make said detection reference wavelength coincide with said set wavelength based on said temperature dependence map; and

a second control unit which exposes said substrate via said mask by irradiating said laser beam on said mask, while performing feedback control on a wavelength of a laser beam emitted from said light source unit based on monitoring results of said beam monitor mechanism which has completed said set wavelength calibration.

197. (Previously Presented) The exposure apparatus according to Claim 196, said exposure apparatus further comprising:

a projection optical system which projects said laser beam outgoing from said mask onto said substrate;

an environmental sensor which measures a physical quantity related to nearby surroundings of said projection optical system; and

a third control unit which calculates a wavelength change amount to cancel out change in image forming characteristics of said projection optical system due to change in

said physical quantity from a standard state based on measurement values of said environmental sensor and changes said set wavelength in accordance with said wavelength change amount, each at a predetermined timing after exposure on said substrate by said second control unit has started.

198. (Previously Presented) The exposure apparatus according to Claim 197, said exposure apparatus further comprising:

an image forming characteristics correction unit which corrects image forming characteristics of said projection optical system, and

said image forming characteristics correction unit corrects change in image forming characteristics excluding change in image forming characteristics of said projection optical system corrected by changing said set wavelength, each time when said set wavelength is changed by said third control unit.

199. (Previously Presented) The exposure apparatus according to Claim 196, wherein said light source unit further comprises:

a fiber amplifier which amplifies said laser beam from said laser light source; and

a wavelength conversion unit which includes a nonlinear optical crystal to convert a wavelength of said amplified laser beam into a wavelength in an ultraviolet region.

200. (Previously Presented) An exposure apparatus that exposes a substrate coated with a photosensitive agent with an energy beam, said exposure apparatus comprising:

a beam source which generates said energy beam;

a wavelength changing unit which changes a wavelength of said energy beam emitted from said beam source; and

an exposure amount control unit which controls an exposure amount provided to said substrate in accordance with an amount of change in sensitivity properties of said photosensitive agent due to a change in wavelength, when said wavelength is changed by said wavelength changing unit.

201. (Previously Presented) An exposure apparatus which transfers a predetermined pattern onto a substrate by irradiating an exposure beam onto said substrate, said exposure apparatus comprising:

a plurality of optical fibers that emit light which wavelength is in one of an infrared and a visible region;

a polarization adjustment unit which orderly arranges a polarized state of a plurality of light beams with the same wavelength having passed through said plurality of optical fibers;

a polarized direction conversion unit which converts all light beams having passed through said plurality of optical fibers into a plurality of linearly polarized light beams that have the same polarized direction;

a wavelength conversion unit which performs wavelength conversion on light beams emitted from said polarized direction conversion unit by said light beams passing through at least one nonlinear optical crystal to emit light having a wavelength in an ultraviolet region; and

an optical system which irradiates light emitted from said wavelength conversion unit onto said substrate as said exposure beam.

202. (Previously Presented) An exposure apparatus that forms a predetermined pattern by irradiating an exposure light on a substrate, said exposure apparatus comprising:

a light amplifying unit which includes an optical waveguiding member mainly made of one of phosphate glass and bismuth oxide glass doped with a rare-earth element, and amplifies incident light;

a wavelength conversion unit which converts a wavelength of light emitted from said light amplifying unit; and

an optical system which irradiates light emitted from said wavelength conversion unit onto said substrate as said exposure light.

203. (Previously Presented) The exposure apparatus according to Claim 202, wherein said optical waveguiding member is an optical fiber, which has a core to waveguide light and a cladding arranged in the periphery of said core.

204. (Previously Presented) The exposure apparatus according to Claim 202, wherein said wavelength conversion unit generates said exposure light, which has a wavelength of 200nm and under.

205. (Previously Presented) An exposure method which repeatedly transfers a pattern formed on a mask onto a substrate, said exposure method including:

a first step of amplifying a pulse light using a fiber amplifier at least once;

a second step of exposing an area subject to exposure on said substrate via said mask by irradiating said amplified pulse light onto said mask; and

a third step of converting a laser beam emitted from a light source to said pulse light and controlling at least one of a frequency and a peak power of said pulse light in accordance with a position of said area subject to exposure on said substrate, prior to said first step.

206. (Previously Presented) The exposure method according to Claim 205, wherein said fiber amplifier is arranged in plural and in parallel, and

in said first step, said pulse light is amplified by using only selected fiber amplifiers.

207. (Previously Presented) The exposure method according to Claim 205, wherein said light source generates a laser beam in one of an infrared and a visible region, and said exposure method further includes:

a fourth step of performing wavelength conversion on said amplified pulse light for conversion into an ultraviolet light before said pulse light is irradiated on said mask.

208. (Previously Presented) An exposure method which forms a predetermined pattern on a substrate by exposing said substrate with a laser beam, said exposure method including:

a first step which sequentially performs sub-steps of;

a first sub-step of measuring a temperature dependence of a detection reference wavelength in a wavelength detection unit used to detect a wavelength of said laser beam,

a second sub-step of performing absolute wavelength calibration to make said detection reference wavelength of said wavelength detection unit almost coincide with an absolute wavelength provided from an absolute wavelength provision source, said absolute wavelength close to a set wavelength, and

a third sub-step of setting said detection reference wavelength of said wavelength detection unit to said set wavelength, based on said temperature dependence obtained in said first sub-step, and after these sub-steps are completed,

a second step of repeatedly performing exposure on said substrate with said laser beam, while controlling a wavelength of said laser beam from said laser light source based on detection results of said wavelength detection unit which said detection reference wavelength is set at said set wavelength in said third sub-step.

209. (Previously Presented) The exposure method according to Claim 208, wherein an optical system is further arranged on a path of said laser beam, and said exposure method further includes:

a third step of changing said set wavelength in order to cancel a change in optical performance of said optical system.

210. (Previously Presented) A making method of an exposure apparatus that forms a predetermined pattern on a substrate by irradiating an exposure light on said substrate via an optical system, wherein adjustment of properties in said optical system is performed by using light which wavelength belongs to a predetermined bandwidth including a wavelength of said exposure light, said light generated by a light source unit according to Claim 174.

211. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure apparatus according to Claim 185 in said lithographic process.

212. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure apparatus according to Claim 189 in said lithographic process.

213. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure apparatus according to Claim 191 in said lithographic process.

214. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure apparatus according to Claim 192 in said lithographic process.

215. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure apparatus according to Claim 194 in said lithographic process.

216. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure apparatus according to Claim 196 in said lithographic process.

217. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure apparatus according to Claim 200 in said lithographic process.

218. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure apparatus according to Claim 201 in said lithographic process.

219. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure apparatus according to Claim 202 in said lithographic process.

220. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure method according to Claim 205 in said lithographic process.

221. (Previously Presented) A device manufacturing method including a lithographic process, wherein exposure is performed using said exposure method according to Claim 208 in said lithographic process.

222. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 211.

223. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 212.

224. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 213.

225. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 214.

226. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 215.

227. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 216.

228. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 217.

229. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 218.

230. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 219.

231. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 220.

232. (Previously Presented) A device manufactured using said device manufacturing method according to Claim 221.